





United States Department of The Interior

Fish and Wildlife Service

Choteau, Montana

Pishkun National Wildlife Refuge

Annual Report

July 1, 1940 to June 30, 1941

United States Department of The Interior

Fish and Wildlife Service

Choteau, Montana

1 WILDLIFE

A. New Species

No new birds have been identified since the compilation of the complete list included in the report of fiscal year 1940.

B. Concentrations

Waterfowl and Shore-birds.--During July of 1940, approximately 5,100 birds of 29 species were noted on the refuge of which about 2,000 were Ruddy Ducks and Horned Grebes.

During the quarter ending October 31, 1940, populations ranged from a low of 3,654 birds on September 11, to a high of 23,629 on October 9. On October 26, there were 17,323 birds on the refuge. Birds on the refuge on October 9, 1940 numbering a thousand or more were;

American Coot	6,000
Ruddy Duck	4,500
Lesser Scaup	3,000
Mallard	2,500
Redhead	2,000
Baldpate	1,500
Pintail	1,200
Canvas-back	1,000

Due to an early freezeup all birds left the refuge considerably earlier this year. Very few American Goldeneye stopped on the refuge during the fall migration, however from 1 to 5 of these birds were noted at different times throughout the

WILLOW CREEK NATIONAL WILDLIFE REFUGE

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CHOTEAU, MONTANA

1. WILDLIFE

A. New Species

No new birds have been noted since compilation of the complete list included in the report of fiscal year 1940.

B. Concentrations,

During July, 1940, 3377 waterfowl and shore birds of 28 species were noted on the refuge. For this same period of 1939,; 2424 were estimated on the refuge.

Pelicans (White) increased from 75 in July of 1939 to 350 in July of 1940, and during these same periods, California Gulls increased from 300 to 600.

A large decrease was noted in the number of Grebes of all kinds using the refuge during July of 1940 as compared with July 1939.

A very marked decrease was noted in numbers of ducks, geese, grebes, and coots during the quarter ending October 30 as compared with the same period of 1939. During the quarter ending October 30, 1940, estimates on numbers of waterfowl and shore birds ranged from 3479 on August 1 to 1520 on October 30. During this same period of 1939 there were 5800 birds on the refuge on August 19 and 25,637 on October 25. The largest number of American Coots noted during fall migration this fiscal year was 800 as compared with 7200 for last year. With the ex-

ception of shore birds this decrease was noted in all species of waterfowl.

During November of 1940 only 800 birds were on the refuge, these being practically all Mallards. During November and December of 1939, populations ranged from 3200 on November 8 to 1668 on December 18, after which time all waters froze over. Due to the extremely low water conditions this year, habitats were much less desirable and waters freeze over much sooner.

Spring migration data this fiscal year compared with that for last year shows that during March of 1940, populations ranged from 172 to 43,325. During March of 1941 the highest number reached was 4257. During April of 1941 this number was increased to 7000 whereas during April of 1940 there were 11,574 birds on the refuge. Here again the greatest decrease this year as compared with last year is in the number of American Coot.

Nesting populations this fiscal year as compared with last are slightly lower on the average. 1745 birds were noted during May and 1478 during June of 1940, whereas during May and June of 1941 there were 1668 and 1100 respectively.

65 Western Willet, 53 White Pelican and 4 Common Cormorant were noted on June 28 this fiscal year.

11. WATERLEVELS.

During July of 1940 waterlevels at Willow Creek dropped to zero on the gauge. This took very nearly all the waters

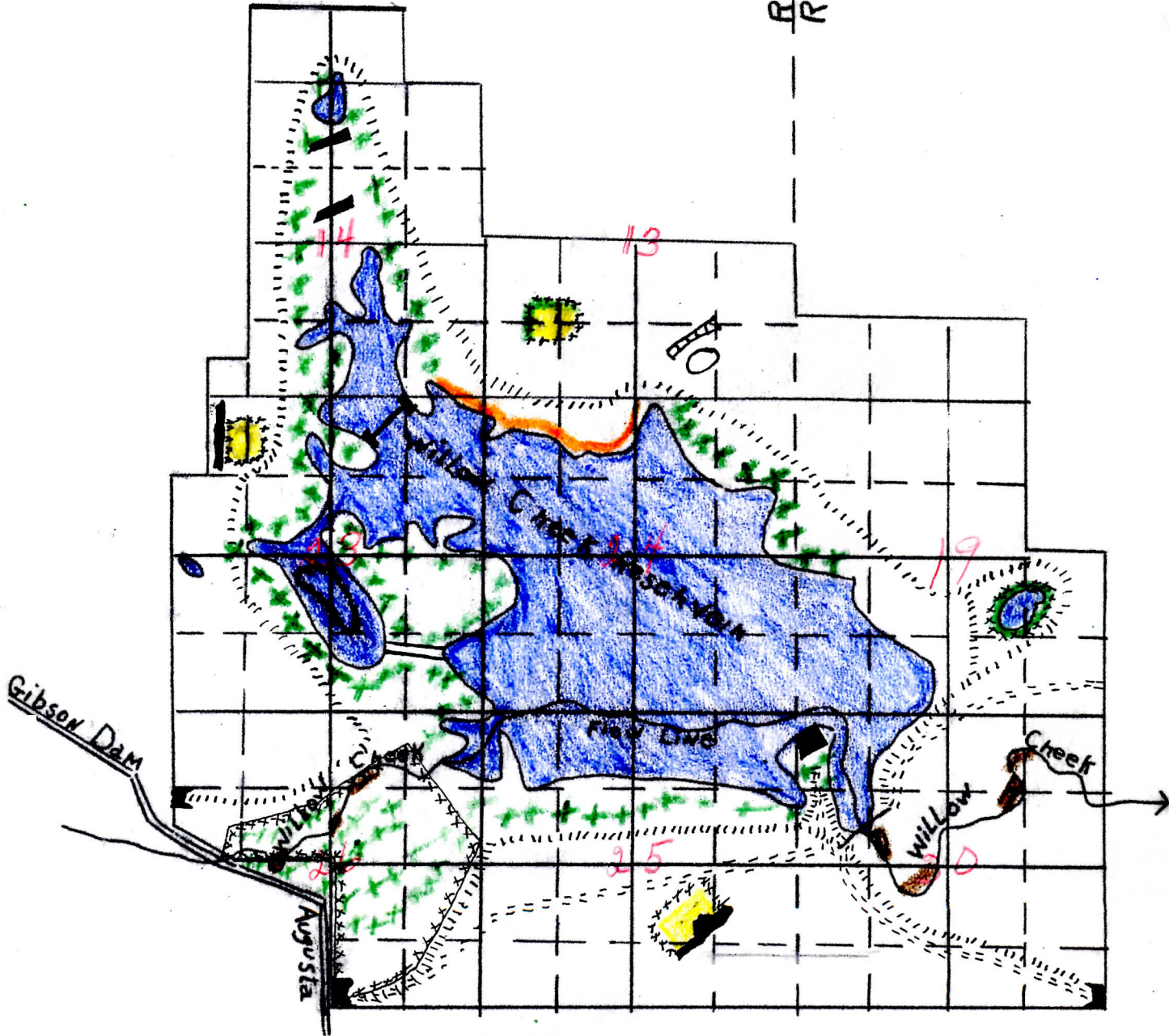
immediately above the dam and in the main reservoir basin, leaving only a few potholes in the upper end of the basin that could not be drained. The flow of water into the reservoir is very small, and although the outlet gates were again closed after the basin was drained, the raising of the water level was very slow. By April 30, 1941, water-levels had raised 16.8 feet above zero on the gauge, however this raise was not sufficient to spread water over more than only a very small portion of the area immediately above the dam. During May of this year the water level was again lowered to zero on the gauge and remained in this position throughout the balance of the year.

It is believed that the immense decrease in water birds on the refuge this year as compared with last should be contributed to unsatisfactory water conditions.

Upland Birds (Pintail Grouse) have increased about 100 % during the fiscal year just ended.

North

R7W
R6W
















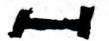


Willow Creek Bird Refuge

Scale

1 Mile

R7W
R6W

-  Old fishermans trails.
-  Proposed improved roads
-  Proposed fences
-  Areas already fenced
-  Proposed Dikes
-  Proposed cuts
-  Proposed cattle guards
-  Proposed recreational area, each area to contain an incinerator and 3 fireplaces.
-  Proposed plow furrows on contour
-  Proposed snow fence
-  Proposed cereal patches
-  Proposed shelter belts
-  Proposed fruit bearing shrubery
-  Proposed aquatic plantings
-  Proposed bird shelters
-  Recommended dike

Annual Report, Willow Creek

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
June 30, 1940

1 WILDLIFE

A Species found on Refuge.

a. Migratory Waterfowl

All species found on Pishkun with the exception of the European Widgeon have been also found on Willow Creek. In addition to those found on Pishkun, 5 Old Squaw Ducks were observed on December 18, 1940.

b. Other Birds

In addition to other birds found on Pishkun, the Yellow Bellied Sapsucker and Red Shafted Flicker have been noted at Willow Creek.

c. Mammals

- | | |
|-------------------------------|---------------------|
| 1. Skunk | 8. Mice |
| 2. Coyote | 9. Pocket Gopher |
| 3. Cottontail Rabbit | 10. Marmot |
| 4. Jack Rabbit | 11. Weasel |
| 5. Columbian Ground Squirrel | 12. Muskrat |
| 6. Richardson Ground Squirrel | 13. Mink |
| 7. Badger | 14. White Tail Deer |

B. Comparisons and Concentrations

Concentrations of waterfowl on Willow Creek Refuge were very heavy during spring migration period this year. Estimates on the number of waterfowl using the refuge on March 23, 1940 totaled 43,325 birds of 14 species. Of this total 35,000 were estimated to be Pintails. On March 14, 4,324 birds were using the refuge and on March 28, a total of 19,045. At no time during the preceeding fiscal year were waterfowl counts as high as the present year. During the peak of the migration season for the preceeding year about 12,000 birds were estimated to be using the refuge.

600 Canada Geese remained on the refuge up to December 23, 1939 at which time all waters were completely frozen over.

A new specie observed on the refuge this year was Old Squaw Ducks 5 of which were seen on December 18.

2. USE MADE OF REFUGE

A. Shelters

Two upland bird shelters constructed during the spring of 1939 were used very extensively by Pintail Grouse.

These grouse not only took advantage of the feeding station maintained in connection with each shelter but also used the shelters for shade on hot sunny days.

B. Nesting Boxes.

Eleven nesting boxes for tree nesting ducks were hung in trees, set in brush clumps or hung on posts. Upon examination of these boxes on June 27, 1940, two were found to be occupied by Sparrow Hawks, eight were unoccupied and in the remaining one a pair of Yellow-bellied Sapsuckers was found dead. The bodies were so decomposed that the cause of the death could not be determined.

C. Economic Uses.

Like Pishkun, Willow Creek is a Reclamation area with economic uses under control of the Reclamation Bureau.

B. PLANTINGS

A. Trees and Shrubs

150 Carangana shrubs were planted at Willow Creek.

4. PREDATOR CONTROL

Predators were controlled only around the upland bird shelters in the nesting area. 4 skunks and 2 weasels were taken.

5. REFUGE IMPROVEMENTS

Physical improvements made on the refuge during the fiscal year consisted of construction and putting out of 11 nest boxes for tree nesting ducks and construction of one upland bird shelter. This shelter, 12' by 30' was constructed entirely out of material close at hand to the refuge such as brush, poles, and straw, and all work was done by the Laborer-Patrolman paid out of regular funds. Upland bird shelters previously constructed were fenced during this year.

6/LAW ENFORCEMENT

Regular patrol trips were made to this refuge and on one of these trips during December one trapper was arrested for trapping muskrats in the fenced in nesting area on this refuge. This trapper was arraigned before a U. S. States Commissioner and the case turned over to a U. S. Attorney. The outcome of the case was never revealed to the Refuge Manager.

UNITED STATES DEPARTMENT OF AGRICULTURE

7. WATER CONDITIONS

BUREAU OF BIOLOGICAL SURVEY

Water levels in the Willow Creek Reservoir did not raise as high this year as it did last year due to a smaller run off from the creek feeding the reservoir. The raising of the water on this refuge has always in the past been very gradual and has usually reached its peak by the first of May. Between May first and June 15th, the level remains fairly constant. Although about the same amount of water runs into the lake during this period, evaporation is much greater. After June 15th, the water level started receding very rapidly due to water being taken out by the Reclamation Bureau for irrigation purposes.

During the period of high water levels some very good islands are formed on this refuge. On one of these islands, which is only a point extending out into the lake at this time, about 300 young California Gulls and eggs were counted.

It is believed that the Reclamation Bureau are planning on increasing the water capacity on this refuge considerably this coming year. All of the islands at the present water level will be completely submerged along with a very large percent of the fenced nesting area.

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1 GENERAL

A. Weather Conditions

<u>1941</u>	<u>Snowfall Inches</u>	<u>Precip.</u>	<u>Max.Temp.</u>	<u>Min.Temp.</u>
Feb.	4.0	.20	66	-9
Mar.	T	.10	64	2
April	<u>.5</u>	<u>1.04</u>	72	12
Total	4.5	1.34		
<u>1940</u>				
Feb.	11.5	.26	51	-19
Mar.	10.5	.54	64	4
April	<u>8.3</u>	<u>2.17</u>	74	-12
Total	30.3	2.97		
<u>1939</u>				
Feb.	4.8	.19	50	-41
Mar.	2.0	.11	74	-12
April	<u>12.0</u>	<u>.47</u>	84	11
Total	18.8	.77		
<u>1938</u>				
Feb.	6.0	.29	65	-28
Mar.	8.5	.47	58	- 2
April	<u>1.5</u>	<u>.37</u>	74	- 2
Total	16.0	1.13		
<u>1937</u>				
Feb.	2.0	.09	49	-24
Mar.	4.6	.39	67	- 7
April	<u>T</u>	<u>.05</u>	76	19
Total	6.6	.53		

All weather observations recorded in the preceding tables were taken from data filed in the County Extension office in Choteau. Pishkun is almost 500 feet higher than is Choteau. Precipitation and depths of snow are not always the same although the average is fairly close when taken over an extended period. Some times there is more snow and precipitation at Pishkun during a particular storm and other times this situation is reversed. There is no equipment at Pishkun for recording weather data and the Reclamation Service does not record this data at Pishkun. Choteau is therefore the closest official station that does.

A study of the preceeding tables shows that with the exception of March in 1937, February and March of 1941 were the driest of the 5 year period, yet with an unusual amount of precipitation during April, the quarter was second high during this same 5 year period. The moisture during April of 1941 was principally in the form of rain. Due to unusually mild weather throughout the quarter, frost came out of the ground early and practically all moisture soaked in immediately, causing no runoff. On April 16 and 17 this vicinity experienced its worst blizzard in several years. The recorded depth of snow on the level was only $\frac{1}{2}$ inch but due to the high velocity of the wind, high snow drifts were formed in sheltered places, some of

which still remained on April 30. The entire quarter up to the middle of April has been exceptionally windy.

B. Water Conditions

Gauge Readings (end of month)

	Feb.	Mar.	April
1940	4342.	4342.	4358.5
1941	4351.2	4351.2	4357.8

All waters on the refuge were completely frozen at the beginning of the quarter. During February a small portion of the lake within the nesting area on the southwest corner of the refuge opened up and remained so except for short periods of zero weather during February and March. This lake is feed by a small stream of warm spring water. Other lakes on the refuge started thawing about March 1st. The ice in the main body of water however did not start to break up until March 22nd. and by March 29 the ice was entirely gone. Ice was not near as heavy on any of the waters of the refuge this year as it was last year and the general disappearance of ice was about 1 week earlier.

During February and March and up to April 23, the water level in Pishkun remained the same as preceeding winter months. Water from the Gibson Lake in Sun River Canyon started flowing into the reservoir at 7:30 p.m. April 23. A 400 foot stream was started on this date and increased about 50 feet a day until the carrying capacity of the canal is reached. By

April 30th. the water level had raised from 4351.2 to 4357.8. This is just .07 of a foot lower than it was on April 30, 1940. If withdrawal of water from the reservoir does not start too soon it is expected that water levels will reach 4374 during May whereas last year 4370 was the high mark reached.

11. WILDLIFE

A. Waterbirds

1 Populations

Whistling Swan: These birds first noted on March 7th., and last seen on April 14. On March 22nd., 63 were observed on Pishkun. During this quarter of 1940 Swan were first noted on March 16 and last seen on April 23rd.

Canada Geese: Only 8 Canada Geese were observed on the refuge this quarter. These were seen on March 31st. Last year 50 were noted on the refuge during the entire last half of March, and two still remained up to April 23.

Snow Geese: March 26th. was the first observation date on these birds. At this time 85 were noted on the lake, but numerous flocks from 100 to 400 birds passed over without stopping. On April 2nd., 2000 geese spent the night and part of the next day on the lake. 200 were also noted on April 7th. but none thereafter. Data taken from this quarter of 1940 shows that Snow Geese arrived

March 20th., one week earlier than this year, but were last seen about the same time April 6th. It was noted that these birds did not feed anyplace on the refuge this year as they did last season.

Mallard: 30 noted on March 7th. No large flight has been noted at any time during the quarter, however during March these birds steadily increased. On March 26th., 200 were noted and at the present time about 400 are scattered out over the many small lakes and potholes at Pishkun and Easements. Mallards were paired off when first noted on the refuge.

American Pintail: Outside of the regular winter residents of this area, the Pintail is again the first arrival of the spring migration. These birds were first noted on March 6th., almost as soon as there was any at all open water. On March 6th., 7 males and 7 females were noted. On March 7th., 125 were noted. March 26 and 27th., was about the peak of migration, about 7,500 being observed on the refuge. Throughout all of April these birds remained numerous, there being on April 30th. about 500 left at Pishkun.

Although estimates were about 2,500 smaller than during the peak of the spring migration last year, about 3 times as many are left on the refuge at the end of the quarter. It is believed that a much larger percentage of these birds will nest, especially in the easements,

this year. Last year birds were disturbed by constant travel and blasting of rock for construction work on the dikes at Pishkun.

Baldpate: The arrival of the Baldpate at Pishkun was within 2 days of being the same as last year. On March 20th. of 1940, 15 were noted and on March 22, this year 12 were observed. During all of April 1941, about 1000 Baldpates have remained on the refuge. Many of these ducks were already mated upon arrival, but on several observations during March and the earlier part of April, as many as 7 or 8 males were seen with one female. These were always off away from the main flock and usually along the shore. The female however, at time of observation, seemed to have a preference for one male in the bunch following her, and would help him to fight off the others. When fighting off these extra males, both male and female would have their wings crossed over their back and would dart out after these others making a loud hissing noise almost like a cat. While all this was going on the balance of paired ducks in the flock were very busy feeding.

Shoveler: These ducks were first noted on March 29, and at the end of the quarter about 200 were noted. Birds were paired upon arrival. The arrival of Shovelers on the refuge this year was about 3 weeks earlier than 1940.

Gadwall: On April 2nd. one Gadwall was noted, 4 on April 20th., and 40 on April 30th. The 4 on April 20, consisted of 2 mated pairs, and those on April 30 were also mated. These ducks are about two weeks earlier than last year but are not as numerous as on April 30, 1940, at which time about 300 were on the refuge.

American Goldeneye: These ducks were observed in small numbers at first, throughout the entire quarter when open water was available. On February 5th., 6 were noted and remained around the vicinity up to March 7th. On March 7th., 14 males were observed. By March 22nd., 250 were noted and on the 26th., 300. These ducks remained throughout the forepart of April, but on April 20, only 50 were counted. This however was the last date these ducks have been seen.

Canvas-back: On March 7th., 5 male Canvas-backs were observed and also again on March 9th. On March 22nd., 30, both males and females were noted. By April 7th., these ducks had become quite numerous. On April 20th., 400 were observed in one raft on the large lake of the refuge. On April 30th., 17 pairs were noted on the small reed lakes in the easements, and of a large raft of mixed ducks and grebes on the large lake, a great many were canvas-backs.

Redhead: On the 7th. of March, 2 male Redheads were noted but not another one was seen on the refuge until April

30th. On this date 40 males and females in pairs were seen in the southwest nesting area and small reed lakes in the easements. Redheads were also scattered throughout the large raft of ducks on the main Pishkun lake on this date. During March of 1940 up to 350 of these ducks were observed on the refuge. This number was reduced gradually during April until there were only about 30 left at the end of the quarter. This year with the exceptions of the two seen early in March, they are much later in arriving or else the spring migration is considerably smaller than it was last year.

Buffle-head: The arrival of the Buffle-head is about 10 days later this year than last. On April 2nd., 7 were noted and on the 20th., 43 were counted. These were principally males although several pairs were noted on some of the smaller lakes.

Lesser Scaup: 100 of these ducks were noted on April 11th., 150 on April 20th., and about 400 on April 30th. The greater percentage of these ducks seemed to be males at the time of the earlier observations but at the end of the quarter very little difference could be noted.

Ruddy Duck: April 30th. was the first observation of this duck. At this time 9 pair and 7 extra males were observed on small lakes. Quite a few males were also noted on the large lake but distance was too great to determine accurately if there were many females in the

large raft of mixed ducks and grebes then on the lake. Last year the first observations of Ruddy Ducks was on April 23rd.

American Merganser: These ducks were common over the refuge from March 27th. to the end of the quarter, ranging in numbers from about 30 to 100.

American Coot: One Coot was seen on April 3rd. and from then on until the end of the quarter they have increased steadily and rapidly, there being about 2000 on the refuge on April 30th.

California Gulls: Two of these birds were first noted on March 22nd. They have increased until about 350 are on the refuge at the present time. Nest building started about April 20th. In 1939 a large number of nests were built on a small rocky island in Pishkun, but were later flooded out. During April of 1940 and at the present time nesting gulls here have been building their nests on islands of the Split Rock Lakes, immediately joining the refuge boundry on the southwest.

Killdeer: These birds have been noted usually in pairs, along the shores of all the lakes constantly since March 26th. and at times they even come up on the lawn space of the residence building at Pishkun.

Great Blue Heron: Only 1 of these birds was noted, this on April 28. On April 23 last year 4 were noted.

Curlew: Curlew were first noted on April 20th., when 6 were noted on the north shores of Pishkun. At the end of the quarter a large number of these birds were noted scattered out over the entire refuge. A large percent of the birds now here will nest on the refuge, especially in the easements.

Avocet: Two birds were noted on April 24th. along the south shore line of Pishkun.

Common Loon: About 40 were noted on Pishkun on April 20th. On April 23, 1940, 30 were noted. The majority of these birds remain on the refuge throughout the entire summer, although nests or young birds have never been observed.

Grebes: Horned Grebes arrived about the same time as in 1940, April 20th., at which time about 50 were noted. On April 30th. about 200 were identified on the large lake.

12 Western Grebes were noted on April 20th.

On April 30th., 3 pair of Holboell Grebes were noted in the southwest nesting area. This area has been used by both Horned and Holboell Grebes for nesting purposes during 1939 and 1940.

11 Food and Cover

Food and cover plants of the upland type are very poor on all of Pishkun with exceptions of the fenced nesting areas.

Aquatic vegetation in all of the smaller lakes has

improved very much during the past two years due to plantings during 1938 and 1939 and also some in 1940. Round stem bulrushes of the large type have completely surrounded the shore line of many of the small lakes in the nesting areas and in the easements, furnishing better nesting sites this year for Redheads, Canvas-backs, Ruddies American Coots, Grebes and other smaller birds such as Yellow-headed and Black-winged blackbirds. The nesting area in the southwest corner of the refuge this year will furnish an excellent nesting site for Mallards, Gadwalls, Pintails and Baldpates as well as divers and other birds.

B. Upland Birds.

1 Populations

Approximately 25 pair of Hungarian Partridges have been noted along the canal bank from the reservoir down through the easements. Several pair were also noted along the canal leading into Pishkun and approximately 10 pair on the higher bench land of the easements.

Yellow-headed and Red-winged Blackbirds arrived on the refuge about April 20th. and are around the small reed lakes in large numbers.

Meadow Larks are also very numerous all over the refuge.

C. Fur-bearing Animals and Predators

During this quarter Muskrats have been noted singly or in two's and three's in all of the 30 or more small

lakes of the refuge including the easements, and also at several locations along the shore of the main lake.

Skunk and Weasel were noted only occasionally during the quarter, and no Coyotes have been seen.

D Other Mammals.

On April 27 an Antelope was seen in the refuge field near the southeast point of the lake.

111. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Developments:

No development program has been started during the quarter.

B. Maintenance.

During the quarter all woodwork on the service building and office combined, was given 2 coats of white paint. A few of the windows that had not been painted before have been given the third coat also. This wood work includes the eaves of the building, window sashes and frames and doors. A second coat of paint was also given the latrine at the headquarters site. On the residence building the back porch woodwork and the basement hallway walls, ceiling and doors was given its third coat of paint. On February 7th. the small boat at Pishkun was repainted a battleship gray.

Sixteen refuge sign post were reset during the quarter.

The fishermen's camp grounds on the north side of Pishkun was cleaned up and the sod taken away from the 3 fireplaces and replaced with sand and gravel. The gate leading into this camp ground had been run into with a car, one post and the brace being knocked down. This was repaired and a lock put on the gate so as to keep cars out of the fenced grounds. Locks were also put on the two gates of the fenced nesting area on the north side of Pishkun and minor repairs made to the fence.

At the headquarters site considerable time was spent in cutting, cording, and sorting of the pile of waste lumber material and wood behind the service building.

Minor repairs was made to the Chevrolet stakebody truck USDA 61-114, and this truck is now being used for hauling water. Repairs consisted of completely removing of the entire fuel system, except fuel tank, and cleaning. The fuel pump arm had to be built up. This was wore so that pump was not making a full stroke. Batteries had been taken out of all the unused trucks at Pishkun prior to the setting in of winter. This spring two of these old used batteries were found to still be good so were recharged, one being put into the above mentioned truck and one being available for one of the dump trucks. It is planned to make such minor repairs as are necessary to one of the dump trucks and put it into operation hauling gravel in holes on the roads of the refuge during the coming quarter.

The unlevelled basement dirt pile to the west of the residence quarters was leveled during the quarter, this being done entirely with hand tools.

IV. PUBLIC RELATIONS

A. Recreational Uses.

1. Recreational Areas.

Due to the close of the fishing season and also the unfavorable weather conditions during this quarter, recreational areas were only used occasionally.

2. Visitors

Mr. Mushbach visited the refuge on April 14th. About 75 other visitors of the general public, from Choteau Power, Fairfield, and Great Falls visited at the refuge.

B. Participation in Wildlife Week.

News articles furnished by the Service were given to and published in two of the local papers.

Wildlife poster stamps were purchased and some assistance extended the local sportsmans club in disposing of their share of these stamps.

V. OTHER

A. Photos.



April 2nd. Whistling Swan just taking off from one of the small lakes in the easements at Pishkun.



April 2nd. A marmot not liking this particular hole where it was chased into for the purpose of taking a picture, is waiting his chance to leave and get into a more suitable one. Many of these rodents are found along the canal in the refuge.



April 3rd. Snow Geese at rest on main lake at Pishkun. This picture was taken about 6:10 a.m. just as the sun was breaking over dam. About 2000 geese were in this bunch.



April 8th. Female Pintail. Picture taken just below dam and outlet canal.

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1 GENERAL

A. Weather Conditions

<u>1941</u>	<u>Snowfall (inches)</u>	<u>Precip.</u>	<u>Max.Temp.</u>	<u>Min. Temp.</u>
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April	<u>T</u>	<u>.05</u>	76	19
Total	6.6	.53		

All weather observations recorded in the preceding tables were taken from data filed in the County Extension office in Choteau. Willow Creek is about 200 feet higher than Choteau. Precipitation and depths of snow are not always the same although the average is fairly close when taken over an extended period. Some times there is more snow and precipitation at Willow Creek during a particular storm and other times this situation is reversed. There is no equipment at Willow Creek for recording weather data and the Reclamation Service does not record this data at Willow Creek.

A study of the preceeding tables shows that with the exception of March in 1937, February and March of 1941 were the driest of the 5 year period, yet with an unusual amount of precipitation during April, the quarter was second high during this same 5 year period. The moisture during April of 1941 was principally in the form of rain. Due to unusually mild weather throughout the quarter, frost came out of the ground early and practically all moisture soaked in immediately, causing no runoff. On April 16 and 17 this vicinity experienced its worst blizzard in several years.

The recorded depth of snow on the level was only $\frac{1}{2}$ inch but due to the high velocity of the wind, high snow drifts were formed in sheltered places, some of

which still remained on April 30. The entire quarter up to the middle of April has been exceptionally windy.

B. Water Conditions

Gauge Readings (end of month)			
	Feb.	Mar.	April
1940	4123.75	4124.2	4124.4
1941	4099.6	4100.8	4101.8

The above table shows that the water level in Willow Creek reservoir is approximately 23 feet lower than on April 30 of 1940.

Operations were started by the Reclamation Service on April 2nd. to raise the existing dam and construct several new smaller dikes so as to raise the holding capacity of the lake about 10 feet from the original high level mark. When this work is completed and the lake is up to its new level, water will be backed up into the fenced nesting area. It is not believed that this will be accomplished this season, however, and birds that will have started nesting will not be in any danger of being flooded out. Water may however reach the old high level before the nesting season is over, as I believe the Reclamation plans on running water down their new canal if and when water is available, (work on the dikes will not interfere with these plans), but is believed that no birds will be nesting between the present level and the old high level as the lake bed between these two lines is dry and hard and completely free of vegetation.

All waters excepting the creek flowing into the lake remained frozen up to March 6th. At this time open water became noticable around the edges of all ponds and by March 10th. about 30 percent of all water areas were open. On March 22nd. all ice was gone.

11 WILDLIFE

A. Waterbirds

1. Populations

Although waterlevels were considerably lower than they were last year, a great many birds stoped at Willow Creek during migration and new arrivals have always been noted here a few days befor they have at Pishkun. Migration as a whole though was considerably lighter than last year. This is especially true of the Pintail, Shoveler, American Coot, and American Goldeneye.

About 7000 waterbirds were noted on the refuge on April 30th.

Whistling Swan: 53 Swan were noted on the refuge on March 10th. and on March 17th. 220 were seen. During 1940 two Swan were noted on March 8th. and 200 on March 23rd. Last year too however, a few were noted on the refuge all through April. This year one lone Swan has been noted at Willow Creek twice since April 20th. It may be that this was the same lone Swan that was seen on Pishkun on April 14th. as this Swan was again seen on Pishkun on May 2nd.

About 400 Swan were noted on Greenfields lake on April 9th.

Canada Geese: 51 Canadian Honkers were noted on the refuge on March 10th. On March 8th., 75 of these birds were seen on Greenfields Lake. 150 were observed on the refuge on March 17th. and 48 on the 22nd. On March 23rd., 1940, 400 were noted.

Snow Geese: Although visits were made to this refuge during the later part of March, no Snow Geese were observed until April 4. On March 23rd. of 1940, 1,500 were noted and although geese were numerous in the air this quarter after March 26, none were noted on the refuge until April 4th., when about 300 were seen. 150 were also noted on April 8th.

Mallard: From 50 to 100 Mallards were seen in the creek flowing through the nesting area throughout all of February and the first part of March. On March 10th., 300 were on the refuge and this number remained about the same throughout the balance of the month. On April 7th. about 500 were noted.

American Pintail: These birds were on the refuge on March 10th., about 550 being noted. On March 17th. 3000 were on the refuge. This was the largest number seen this quarter, although the peak of migration was not reached at Pishkun until March 26th. On March 14th,

1940 about 3500 were noted and about 35,000 on March 23rd. Great flocks were noted however this year throughout all of March on the Greenfields Lake and on the Eureka reservoir near Choteau. About 400 of these ducks were on the refuge on April 30th.

Baldpate: Baldpates were first observed on Willow Creek on March 10th. when 25 birds were seen. On March 22nd. 125 were present. 800 were noted on April 8th. This was also about the number that was on the refuge at the end of the quarter. During the spring migration of 1940 2500 were noted at the end of March and 500 on April 30.

Gadwall: The general appearance of Gadwalls was between April 20th. and 30th. Only a very few scattered pairs were noted at first, but by the end of the month about 300 birds were noticed.

Shoveler: These ducks were first noted on April 8th. when about 150 were counted. On April 30th there were about 1,500 on the refuge. On April 8th 1940, there 12 seen and at the end of the quarter about 2,500.

American Goldeneye: Here like Fishkun, American Goldeneye were noted as soon as there was any open water in the lake. Occasionally 1 or 2 birds were noted during February in the open creek. Goldeneyes however were nowhere near as numerous as in 1940. The extremely low water level maybe mostly the cause of this decrease,

however the number of this species at Pishkun was also greatly reduced. On March 10-14-17-22, only 80 to 275 of these birds were noted at Willow Creek. On April 8th about 150 were observed and one on April 30th. A very large number of Goldeneye were noted on two occasions during March on the Greenfields and Eureka Lakes.

Canvas-back: These ducks were first noted on March 19th and the peak of migration reached on about April 8th to 12th. Only about 50 birds were noted on any date up to April 1st. On April 4th 400 were noted on the refuge and about 2000 on April 8th. These ducks remained numerous althrough April there being about 800 present at the end of the month.

On April 9th approximately 25,000 Canvas-backs were noted at Greenfields Lake. As a whole these ducks were much more numerous in this vicinity than lasy year.

Redhead: 25 Redheads were noted on March 10th. These ducks must have left the area soon after because none were seen again until April 8th when 8 were observed. On visits to this refuge between April 8th and 30th only 3 or 4 were observed. On April 30th however, about 200 were present. On this date about 80 percent of all the waterbirds on the refuge were in one large raft and pretty much mixed up and scattered around so that an accurate count of each species was impossible to obtain. It is felt however that an estimate of 200 Redheads is fairly close.

Buffle-head: Although these ducks were ^{not} noted at Pishkun until April 2nd, two were noted at Willow Creek on March 17th. No more were seen until April 8th when 16 were present. At the end of the quarter 30 of these ducks were on the refuge.

Lesser Scaup: On April 2nd, 5 Lesser Scaup Ducks were observed and on April 8th about 200 were noted. By the end of the quarter these ducks had increased until about 1200 were present.

Ruddy Duck: About 250 Ruddies were noted on April 30th. These were all noted scattered through the mixed raft of ducks and grebes on the lake.

American Merganser: From 50 to 100 of these ducks were noted on the refuge from March 10th up to April 8th. On April 22nd and on April 30th only 20 were noted.

American Coot: First observation of Coots at Willow Creek was on April 8th when about 30 were noted. On April 22nd and on April 30th approximately 1500 to 2000 birds were on the refuge. The arrival of these birds was slightly earlier this year but only about half as many have been noted at the end of the quarter.

California Gulls: Between March 10th and 22nd, 15 gulls were seen on the refuge. By April 30th about 300 birds have arrived and nest building was started on one of the high points extending into the lake bed, along about

April 20th. This is the third year that gulls have nested on this point.

White Pelican: Two Pelican were noted on the refuge on April 22nd. On May 4, 1940 seven were noted at Willow Creek.

Killdeer: First noted on March 22nd and have been present constantly since that date.

Curlew: First noted April 22th. 6 pairs were seen on April 30th.

Common Loon: Six were seen on April 30th.

Horned Grebe: About 500 noted on April 30th.

11 Food and Cover.

As all of the ponds and potholes on the refuge are extremely low, aquatic vegetation is very poor. In the fenced nesting area aquatic vegetation in the creek has not been hurt. Large beds of Sago Pond Weed, Ruppia, and Redhead Grass are found along the entire length of the creek flowing through the nesting area. There are also good stands of large Roundstem and some Prairie Bulrush in the slough in this area. The small pothole on the east end of the refuge which used to always contain a good supply of aquatic plants has almost dried up. This pond was always feed by seepage from the main lake but due to the low stage of the main lake no seepage has been coming through since last summer.

Upland food and cover plants are the best yet noted in the nesting area but the balance of the refuge is very poor.

B. Upland Birds

Pintail Grouse have been quite numerous throughout the entire quarter. During February and March these birds were never observed outside the nesting area. They did not however seem to stay as close around the shelters as in previous years. This was likely due to the small amount of snow covering the ground this year. On one observation during March 2 flocks were noted, one with 27 birds and the other with 34. Very little feeding was necessary during the quarter. Feeders were filled once during February and once during March. During April, pairs of these birds were noted scattered all over the nesting area, along the highway bordering the area, on the northside of the main reservoir, and along the creek below the reservoir.

Only a very few pair of Hungarian Partridges have been noted on the refuge during the entire quarter, however they are quite numerous on the creek above the refuge and along the river below the refuge.

C. Fur-bearing Animals and Predators

Two Beaver were observed in the creek in the upper end of the nesting area on April 2nd. One dam had been build by these beaver in the upper end of the nesting area.

On one observation 13 Muskrats were noted in the Creek and 6 in the slough in the nesting area. Rats in the creek use holes in the banks but those in the slough have houses built from the bulrushes growing there.

No Skunk or Weasel have been noted although a few signs have shown that a few of these animals are around. One trap had been kept set by each of the upland bird shelters, but none were even sprung during the entire quarter.

Two Coyotes were observed crossing the refuge on February 21st.

111 MAINTENANCE

Maintenance work at Willow Creek consisted of minor repairs to nesting area fences and resetting of refuge sign posts were down.



April 2nd. Beaver dam in upper end of nesting area at Willow Creek. Two beaver were seen here previous to the taking of the picture.